

COST OF PRODUCTION UPDATE

For 1977 on

**SNAP BEANS
for PROCESSING**

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Introduction

The agricultural industry in New York has long benefited from a continuing research project dealing with specific farm enterprise cost and return data. Commonly known as the New York Farm Cost Account project, this program has provided information for livestock and crop enterprises most prevalent in the State. Some crops, however, are not adequately represented in the records kept by the cooperating farmers to provide enough data to be meaningful to the whole industry. These include various crops grown in sufficient volume to merit specific study to maintain up to date cost of production information.

Data for processing snap beans was collected in 1977. Since the last special study for processing snap beans in New York dealt with the 1962 crop, a major effort was made to sample growers in four producing areas in the State. These four areas were studied in detail so that comparison of results might bring to light differences that may exist between areas within the State. The areas are defined as follows:

- Area 1 - Southwestern New York including growers in Erie, Cattaraugus and Chautauqua counties.
- Area 2 - Western New York including growers in Monroe, Genesee and Orleans counties.
- Area 3 - Central New York including growers in Cayuga, Wayne, Onondaga, Ontario, Oswego and Yates counties.
- Area 4 - Utica New York including growers south and west of Utica.

Procedure

Extension agents and processors concerned with snap beans were contacted to enlist their aid in compiling grower lists for each of the four major snap bean areas in the State. Cooperating growers provided information about their snap bean enterprises for the 1977 year during an interview held after the crop was harvested. The questionnaire was designed to determine the grower's cash costs for the crop and to allocate appropriate overhead costs including labor, tractor, equipment, land and other costs related to the producing and disposition of the crop. The approach used relies heavily upon experience with the Cornell Farm Enterprise Cost Account research project for various cost factors not easily determined in an interview situation and for tests of reasonableness used throughout the study.

A detailed explanation of the procedure and forms used to accumulate crop costs and analysing the enterprises is available in three bulletins published by the Department of Agricultural Economics at Cornell.*

* Enterprise Analysis: A guide for determining Field and Vegetable Crop Costs and Returns, A.E. Ext. 76-4, D.P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, N.Y. 14853.

Enterprise Analysis: A guide for determining Fruit Crop Costs and Returns, A.E. Ext. 76-5, D.P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, N.Y. 14853.

Enterprise Analysis: A guide for determining Farm Tractor and Equipment Costs, A.E. Ext. 76-6, D.P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, N.Y. 14853.

Processing Snap Bean Trends

Trends in United States

Nationwide, snap beans are the third most important processing vegetable according to total production. Only tomatoes and sweet corn are produced in greater quantities than snap beans. Nearly 300 thousand acres are planted to this crop each year with about 92 percent of the planted acreage harvested. National yields have recently averaged about 2.5 tons per harvested acre.

The following tables indicate several trends that have taken place in the last three decades. Total production has more than doubled and is currently in excess of half a million tons per year. During the same time acreage has about doubled along with a gradual increase in yield to the present level of 2.5 tons per acre.

Table 1.

PROCESSING SNAP BEAN PRODUCTION Major producing states United States, 1946-1977

State	1946-55 Average	1957	1962	1967	1972	1977
thousand tons						
Wisconsin	18.6	29.0	55.8	90.3	121.5	185.5
New York	44.2	67.1	81.7	104.6	73.7	96.1
Oregon	52.3	87.5	112.5	132.0	129.9	140.2
Michigan	9.4	9.9	12.6	22.4	35.9	41.3
Tennessee	8.7	13.4	19.4	19.8	28.2	26.1
Illinois	---	---	---	---	21.7	20.2
California	13.7	24.0	30.4	29.7	22.5	15.7
U.S. Total	259.4	359.0	447.7	620.6	613.3	675.9

Source: Vegetables - Processing, Annual Summaries, Crop Reporting Board, ESCS, USDA.

Acreage and production have increased the most in the states of Wisconsin, New York, Oregon and Michigan during the past 30 years. More recently Wisconsin production has been increasing while in the other major producing states production has been fairly stable or showing signs of a downward trend.

Table 2. PROCESSING SNAP BEANS
Harvested Acreage
Major producing states, U.S., 1946-77

State	1946-55 Average	1957	1962	1967	1972	1977
thousand acres						
Wisconsin	12.4	19.3	27.9	43.0	45.5	67.2
New York	26.6	37.3	43.0	52.3	45.5	43.0
Oregon	6.9	10.8	16.3	30.7	35.0	32.5
Michigan	6.8	6.6	9.0	14.9	14.4	16.8
Tennessee	5.3	6.4	9.7	11.0	12.8	13.7
Illinois	---	---	---	---	9.8	7.2
California	2.1	3.0	4.6	13.5	9.1	6.0
U.S. Total	125.6	151.6	181.2	275.9	255.5	257.7

Source: Vegetables - Processing, Annual Summaries, Crop Reporting Board, ESCS, USDA.

Yields of processing snap beans have steadily improved over the past thirty years. Table 3 shows a decline in yield per acre for Oregon and California in the early sixties. This is explained by a shift from hand picked pole beans to machine picked bush beans. Currently most of the major producing states have yields of about 2.5 tons per harvested acre. Several states, Oregon and Wisconsin in particular, irrigate snap beans extensively. On the other hand, New York growers irrigate very little.

The most important technological change in producing snap beans was the advent of the mechanical harvester in the late fifties. This change carried with it production implications in adapted varieties and cultural and management practices as well as significant reductions in harvest labor requirements.

Table 3. PROCESSING SNAP BEANS
Yield per acre
Major producing states, 1946-77

State	1946-55 Average	1957	1962	1967	1972	1977
tons						
Wisconsin	1.5	1.5	2.0	2.1	2.7	2.8
New York	1.6	1.8	1.9	2.0	1.6	2.2
Oregon	7.5	8.1	6.9	4.3	3.7	4.3
Michigan	1.4	1.5	1.4	1.5	2.5	2.5
Tennessee	1.6	2.1	2.0	1.8	2.2	1.9
Illinois	---	---	---	---	2.2	2.8
California	6.2	8.0	6.6	2.2	2.5	2.6
U.S. average	2.1	2.4	2.5	2.2	2.4	2.6

Source: Vegetables - Processing, Annual Summaries, Crop Reporting Board, ESCS, USDA.

During the thirty year period covered by these tables, value per ton of processing snap beans shows a general downward trend until recent years. Within the past five years, however, that trend has reversed with the most significant price increase occurring in 1974. That year value per ton generally increased by 40 to 50 percent and in some states, even more. Since then variation in value per ton has been greater between states and between years than in preceeding years.

Table 4. PROCESSING SNAP BEANS
Value per ton
Major producing states, 1946-77

State	1946-55 Average	1957	1962	1967	1972	1977
dollars						
Wisconsin	112	106	63	81	83	128
New York	122	112	112	92	97	149
Oregon	128	132	119	113	111	137
Michigan	111	112	79	88	97	125
Tennessee	128	126	108	120	115	166
Illinois	---	---	---	---	90	142
California	114	127	134	124	115	186
U.S. average	115	118	105	102	100	142

Source: Vegetables - Processing, Annual Summaries, Crop Reporting Board, ESCS, USDA.

Trends in New York State

Available census data for New York does not distinguish between snap beans grown for market and processing. The data presented in Table 5 indicates trends in harvested acres of all snap beans grown in the four major producing areas in the State. These trends should also reflect acreage changes that have occurred between these four areas for snap beans grown for processing.

During the past thirty years production of snap beans in New York has roughly paralleled the trend for the nation. Production in the late seventies is about double what it was in the late forties. Table 5 indicates a doubling of snap bean acreage in Areas 2 and 3 - Western New York and Central New York - in the past twenty years. At the same time, acreage in the Utica Area - Area 4 - has steadily declined to about one-third of the acreage in the mid-fifties. Area 1 - Southwestern New York - has fluctuated the most in snap bean acreage. Acreage increased to about 21,000 acres in the mid-sixties, then declined to about 16,000 acres - one and one-half times the 1954 acreage. Table 5 also indicates acreages for individual counties during this period of time. As shown, some counties have experienced significant changes in snap bean acreage during the last two decades.

Within the past five years processing snap bean harvested acreage reached a high of 49,700 acres in 1974 according to USDA Crop Reporting Board estimates. Since then, acreage has declined to about 43,000 acres harvested in 1976 and 1977. Typically, 92 to 94 percent of New York's planted snap bean acreage is harvested.

Table 5. HARVESTED ACREAGE OF ALL SNAP BEANS
Counties in major production areas, New York
1954 to 1974

Area - county	1954	1959	1964	1969	1974
thousand acres					
Southwestern N.Y.					
Area 1 - Erie	8.9	11.0	18.7	11.6	9.9
Cattaraugus	.3	.1	.7	1.3	3.9
Chautaugua	<u>1.2</u>	<u>1.9</u>	<u>1.5</u>	<u>4.1</u>	<u>2.7</u>
Total	10.4	13.0	20.9	17.0	16.5
Western N.Y.					
Area 2 - Monroe	2.5	2.2	2.8	2.4	2.4
Genesee	.3	1.9	2.4	2.6	2.6
Orleans	<u>.6</u>	<u>1.0</u>	<u>2.7</u>	<u>4.0</u>	<u>2.7</u>
Total	3.4	5.1	7.9	9.0	7.7
Central N.Y.					
Area 3 - Cayuga	3.5	4.8	2.1	3.1	3.2
Onondaga	.9	.4	.6	1.6	1.6
Ontario	.3	.5	1.3	3.9	4.7
Oswego	2.0	1.0	1.5	1.9	1.6
Wayne	2.2	5.2	8.1	5.9	5.0
Yates	<u>.2</u>	<u>.2</u>	<u>1.7</u>	<u>1.9</u>	<u>2.4</u>
Total	9.1	12.1	15.3	18.3	18.5
Utica N.Y.					
Area 4 - Herkimer	1.6	1.4	1.2	.4	.2
Madison	4.3	3.9	.5	.1	.1
Oneida	7.3	8.9	7.2	4.0	3.7
Otsego	<u>.6</u>	<u>.5</u>	<u>.7</u>	<u>---</u>	<u>---</u>
Total	13.8	14.7	9.6	4.5	4.0
All other counties	8.3	5.4	2.8	2.4	3.6
New York Total	45.0	50.3	56.5	51.2	50.3

Source: U.S. Census of Agriculture

The Growing Season in 1977

Weather has a major influence on crop production in New York State. Even though good cultural practices are followed good yields are highly dependent upon timing and amount of rainfall, temperatures and length of growing season. The following two tables indicate climatic conditions during the 1977 growing season in each of the four snap bean production areas in the state and how that year compares with long term average data.

Each of the four areas had different ways in which weather data deviated from "normal" conditions. All areas had more rainfall than normal for the growing season. Typically, May and June were dry while August and September were extremely wet. The wet harvest season resulted in very difficult harvest conditions and greater than normal unharvested acreages of snap beans especially in the Southwestern and Western New York Areas.

Southwestern New York had a significantly cooler and shorter growing season with nearly 12 inches of rain more than normal for the period of May through September.

The Western New York Area had about 13 inches of rain more than normal combined with a somewhat warmer and longer growing season.

In Central New York, conditions were a little cooler and wetter than normal over a slightly longer growing season.

The Utica Area had nearly normal rainfall during a somewhat warmer season that was 11 days shorter than normal. This Area harvested the highest percent of the planted snap bean acreage.

Table 6. TEMPERATURE, PRECIPITATION AND GROWING SEASON
Selected Stations, New York, 1941-70 and 1977

Area - Station	Average temperature		Precipitation				Length of growing season*	
	May - Sept.	1941-70	May - Sept.	1941-70	May - Sept.	1941-70	1941-70	1977
	degrees F		inches				days	
Southwestern N.Y.								
Jamestown	64.1	61.2	17.6	29.4	-----	53.0	144	127
Western N.Y.								
Batavia	64.0	65.7	15.3	28.8	32.6	49.1	154	158
Central N.Y.								
Geneva	65.3	64.8	14.6	19.2	32.3	38.6	158	161
Utica N.Y.								
Utica	63.5	64.8	18.1	19.6	40.6	49.2	157	146

* Days between the last temperature of 32°F in the spring and the first in the fall.

Table 7. GROWING SEASON RAINFALL
Selected stations, New York, 1941-70 and 1977

Station	<u>May</u>		<u>June</u>		<u>July</u>		<u>Aug</u>		<u>Sept</u>	
	1941-70	1977	1941-70	1977	1941-70	1977	1941-70	1977	1941-70	1977
	<u>inches</u>									
Jamestown	-----	1.55	-----	4.34	-----	6.38	-----	9.06	-----	8.09
Batavia	3.17	.81	2.69	1.98	3.05	6.81	3.50	9.50	2.87	9.66
Geneva	3.02	1.87	3.10	2.24	3.06	2.39	2.82	5.41	2.59	7.33
Utica	3.52	1.21	3.55	3.22	4.17	3.50	3.54	3.95	3.32	7.67

Source: Climatological Data, NOAA, Environmental Data Service, New York Annual Summary, 1977, Vol. 89, No. 13.

RESULTS OF THE STUDY IN GENERAL

The Areas Compared -

With four more or less distinct areas in the State where processing snap beans are grown, one would expect some differences in yields, costs and returns, etc. Table 8 illustrates these differences, as shown by this study, between the Areas as well as between the Areas and the overall State averages.

Table 8. COSTS AND RETURNS
For
PROCESSING SNAP BEANS
by major production areas
New York, 1977

Item	South- western area	Western area	Central area	Utica area	All farms
Number of farms	7	11	17	4	39
Acres per enterprise	1166	395	293	574	508
Yield per acre planted, tons*	2.5	1.9	1.9	2.2	2.2
Per acre planted					
Costs: Growing	\$237	\$180	\$206	\$195	\$212
Harvesting	<u>52</u>	<u>49</u>	<u>53</u>	<u>57</u>	<u>52</u>
Production	\$289	\$229	\$259	\$252	\$264
Marketing	<u>19</u>	<u>12</u>	<u>15</u>	<u>26</u>	<u>17</u>
Total costs	\$308	\$241	\$274	\$278	\$281
Returns	\$336	\$276	\$280	\$315	\$306
Profit	\$28	\$35	\$6	\$37	\$25
Returns per dollar of cost	\$1.09	\$1.15	\$1.02	\$1.13	\$1.09

* Paid weight

This table provides only the general results of the snap bean enterprises included in the study for each of the areas. In each area there was a wide range in snap bean acreage per farm. A later section in this report will deal with the effects of the size of enterprise on profits in raising snap beans for processing.

Overall Results for the State -

The analysis of the processing snap bean enterprises for the State and for each of the four areas will be presented in a series of five tables for each area studied. These will deal with growing costs, harvesting costs, selling costs and a summary of the enterprise costs and returns. The fifth table will present selected factors for each of the enterprises in the group to illustrate the range in these factors between enterprises. Acreage for each enterprise is not listed to protect grower identity.

Following the study of each Area an analysis will be made of the effect of the size of the snap bean enterprise on the costs, returns and profits for the enterprise using all 39 records regardless of location in the State. The effects of yield on enterprise profits will also be studied for the State as a whole. Differences in costs for custom harvesting as compared to costs for owned harvesters are noted for growers in Central New York. Finally, the significant differences between profitable and unprofitable enterprises will be compared.

For the State as a whole, growing costs for processing snap beans averaged \$212 per acre. With an average yield per acre planted of 2.2 tons, growing cost averaged \$99 per ton. The three major growing costs were for seed, land and fertilizer which, together, accounted for nearly two-thirds of the total growing costs (Table 9).

Table 9.

PROCESSING SNAP BEANS
Growing Costs
All Areas, New York
19,793 Acres Planted on 39 Farms, 1977
(17,485 Acres Harvested)

Item	Rates per acre	Cost	
		Per acre	Per ton*
Number of farms		39	
Acres per enterprise		508	
Yield per acre planted, tons*		2.2	
Labor	3.2 hr	\$ 15	\$ 7
Tractor	2.2 hr	12	5
Equipment, large trucks		10	4
Custom work, equipment rent		1	1
Land use		46	22
Lime, cover crop, manure		10	5
Fertilizer: lbs. N-37, P-84, K-41		26	12
Seed: 94 lbs.		66	31
Chemicals		19	9
Interest on operating capital		2	1
All other		5	2
Total growing cost		\$212	\$99

*Paid weight

In Table 10, and for each of the Areas in the State, harvesting cost data is presented on the basis of harvested acres rather than planted acres. Thus, the acres not harvested and, therefore, that didn't generate any harvesting costs, do not dilute or distort the cost of harvesting an acre of processing snap beans. Accordingly, the average cost to harvest snap beans was \$59 per acre or \$24 per ton at a yield of 2.4 tons per acre harvested (Table 10). The major harvesting cost was for equipment - mainly the bean harvesters owned by the growers.

Harvesting conditions were extremely difficult in 1977, particularly in the western part of New York State. Because of that, more than the normal acreage of snap beans was not harvested. Only 88 percent of the planted acreage in this study was harvested as compared to the usual 92 to 94 percent.

Table 10.

PROCESSING SNAP BEANS
Harvesting Costs*
All Areas, New York
19,793 Acres Planted on 39 Farms, 1977
(17,485 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton**
Number of farms	39	
Acres per enterprise	508	
Yield per acre harvested, tons**	2.4	
Labor 2.8 hr/ac	\$13	\$5
Tractor	1	--
Equipment	40	17
Custom work, equipment rent	2	1
All other	3	1
Total harvesting costs	\$59	\$24

*Per acre harvested

**Paid weight

Selling costs as indicated in Table 11 include the costs to haul the crop off the farm to the processor. These costs reflect the use of grower owned trucks to do most of the hauling as well as a significant amount of hauling by custom operators. Many of the processors did not pay the grower immediately for all of his crop leaving the grower with substantial accounts receivable. The cost to the grower to carry these open accounts is reflected in the interest cost of \$4 per acre or \$2 per ton.

Table 11.

PROCESSING SNAP BEANS
Selling Costs*
All Areas, New York
19,793 Acres Planted on 39 Farms, 1977
(17,485 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton**
Number of farms	39	
Acres per enterprise	508	
Yield per acre harvested, tons**	2.2	
Labor	\$ 3	\$ 1
Truck	7	3
Custom haul	4	2
Interest on accounts receivable	4	2
All other	<u>1</u>	<u>--</u>
Total selling costs	\$19	\$ 8

*Per acre harvested

**Paid weight

Total costs for producing and marketing snap beans in New York averaged \$281 per acre or \$131 per ton for these enterprises. Returns averaged \$306 per acre and \$142 per ton on a paid weight basis. Thus, snap beans for processing showed favorable results for 1977 with a profit of \$25 per acre planted and \$11 per ton. Another way of expressing the results of these growers' efforts in 1977 is that these enterprises show a return of \$1.09 for each dollar of cost invested in the crop. These costs include consideration for the growers' management as well as all other costs related to the crop.

Table 12.

PROCESSING SNAP BEANS
Enterprise Costs and Returns
All Areas, New York
19,793 Acres Planted on 39 Farms, 1977
(17,485 Acres Harvested)

Item	Cost or Return	
	Per acre planted	Per ton*
Number of farms	39	
Acres per enterprise	508	
Yield per acre planted, tons*	2.2	
Costs to:		
Grow	\$212	\$ 99
Harvest	52	24
Produce	\$264	\$123
Sell	17	8
Total costs	\$281	\$131
Returns	\$306	\$142
Profit	\$ 25	\$ 11
Return per dollar of cost	\$1.09	

*Paid weight

Average figures for these snap bean enterprises are comprised of the results of 39 individual enterprises representing various inputs and conditions under which the crop was grown. Therefore, considerable variation may be expected when individual results are compared. Table 13 lists several factors for each of the 39 enterprises to illustrate this variation for some of the more important points of interest in the production of snap beans for processing. Acreage has been omitted to protect grower identity.

Table 13.

PROCESSING SNAP BEANS
Selected Factors
All Areas, New York
19,793 Acres Planted on 39 Farms, 1977
(17,485 Acres Harvested)

Farm No.	Yield per acre	Average per acre planted			Average per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Costs	Returns	
	Ton	\$	\$	\$	\$	\$	\$
107	2.8	264	56	63	117	140	1.19
230	2.0	183	43	61	118	150	1.26
102	2.5	234	70	25	126	136	1.08
110	2.3	228	54	-9	130	126	0.97
316	2.0	214	50	14	141	148	1.05
103	2.5	226	71	60	119	144	1.20
414	1.5	203	62	-50	185	151	0.82
231	2.0	179	53	42	119	140	1.18
412	2.6	194	67	107	116	157	1.35
421	2.4	185	52	49	105	125	1.20
322	1.8	206	66	1	152	153	1.01
108	1.4	178	62	-59	172	128	0.75
323	1.4	227	40	-38	194	167	0.86
327	1.9	194	55	45	130	153	1.18
111	2.3	233	64	-6	128	125	0.98
235	2.3	188	67	59	117	144	1.22
317	1.5	230	62	-66	191	148	0.78
236	1.3	169	54	-38	174	145	0.84
239	1.8	179	64	22	137	149	1.09
328	1.9	182	75	39	136	156	1.15
326	1.6	183	52	-3	150	148	0.99
333	2.2	200	64	98	120	164	1.36
404	2.7	199	47	131	103	152	1.47
109	1.0	222	70	-24	154	142	0.92
238	1.8	145	48	36	115	136	1.18
232	1.5	181	81	-42	171	144	0.84
305	2.6	199	85	69	117	144	1.23
315	1.4	218	82	-88	211	148	0.70
224	2.1	183	96	16	134	141	1.06
301	1.7	205	75	-56	159	127	0.80
237	2.2	230	46	67	130	160	1.23
306	2.1	161	66	48	119	142	1.19
225	1.6	150	86	-18	144	133	0.92
334	1.4	219	116	-88	218	155	0.71
319	1.5	160	68	-34	153	130	0.85
229	1.0	202	88	-148	290	145	0.50
313	2.1	217	61	-25	141	129	0.92
318	3.0	187	95	147	103	153	1.48
320	0.9	177	60	-93	242	143	0.59
Range	0.9 to 2.8	145 to 264	40 to 116	-148 to 147	103 to 290	125 to 167	0.50 to 1.48
Weighted average	2.2	212	59	25	131	142	1.09

* Per acre harvested

** Paid weight

Comparison With Previous Study -

The last study of processing snap bean production in New York was made for the 1962 crop year. Production areas were essentially the same as they were in 1977. In Table 14, several factors are compared for the two study years. As these data are compared, one must keep in mind that the results for these two years are only "snapshots" of the history of snap bean production in the State. However, in spite of variations in these factors in years before and after the study years, data for these two study years does give some measure of significant changes that have occurred in the past fifteen years.

Table 14.

PROCESSING SNAP BEANS
COMPARISON OF COSTS AND RETURNS
FROM TWO STUDIES
New York, 1962 and 1977

Item	Year		Percent change %
	1962	1977	
New York State acreage	43,000	43,000	--
Number of farms in the study	57	39	NA
Acres per enterprise	275	508	+85
Yield per acre, tons	1.6	2.2	+38
Average price per ton	\$92	\$142	+54
Total returns per acre	\$150	\$306	+104
Total cost per acre	\$126	\$281	+123
Profit per acre	\$24	\$25	+4
Profit per enterprise	\$6,600	\$12,740	+93
Return per dollar of cost	\$1.19	\$1.09	-8
Index of prices paid by New York farmers (1967=100)	90	213	+137

Although snap bean acreage increased after 1962, State acreage has declined, in recent years, to about the same acreage as for 1962 (Table 2). Average acreage per enterprise has nearly doubled and although the profit per acre was about the same for the two years, the increased acreage per farm resulted in almost doubling the profit per enterprise. Yields have increased by one third. During this fifteen year period when prices paid by New York farmers, in general, increased about 137 percent, cost per acre increased 123 percent. With an average price per ton increase of only 54 percent and the yield increase of 38 percent, the returns per acre increased only 104 percent. Only due to the increased size of enterprise has the profit per enterprise nearly doubled. However, this increase in enterprise profits has not kept pace with the increase in prices paid by New York farmers.

Practices and Inputs -

About 55 percent of the growers used a plateless type planter for their snap bean crop. The others used a standard plate type planter with three of these growers using a rotary cone to minimize seed damage. Both types of planters satisfied the operators with similar likes and dislikes mentioned for each type.

All but two of the growers planted snap beans in rows 36 inches apart. The other two growers used 30 inch rows. The most popular seed spacing ranged from 9 to 11 seeds planted per foot of row.

Most growers used chemicals for leaf hopper and white mold control. Sevin and Di-Syston were used most frequently with a few using Thimet or Malathion. In only a few cases was the control method unsatisfactory. White mold affected some of the acreage of half of the growers. Benlate was used to control and/or prevent the occurrence of white mold. Twenty-two growers sprayed some or all of their bean acreage with Benlate.

All but three growers cultivated their snap beans at least one time. Twenty-three growers cultivated some of their acreage a second time and a few acres were cultivated three times. Only one grower admitted to irrigating a few acres of beans during a generally wet growing season.

Some of the physical inputs to the snap bean enterprise are noted in the following table.

Table 15.

PROCESSING SNAP BEANS PHYSICAL INPUTS PER ACRE 39 Farms, New York, 1977

Item	Southwestern area	Western area	Central area	Utica area	All farms
Number of farms	7	11	17	4	39
Acres per enterprise	1166	395	293	574	508
Yield per acre planted, tons	2.5	1.9	1.9	2.2	2.2
Man hours to:					
Grow	3.3	2.5	3.6	3.5	3.2
Harvest	<u>3.2</u>	<u>1.8</u>	<u>2.0</u>	<u>2.3</u>	<u>2.5</u>
Produce	6.5	4.3	5.6	5.8	5.7
Tractor hours to grow	2.1	1.8	2.6	2.5	2.2
Pounds of seed	103	92	87	85	94
Commercial fertilizer:					
pounds of: N	45	31	31	31	37
P ₂ O ₅	91	69	80	92	84
K ₂ O	39	43	46	31	41

RESULTS FOR EACH AREA IN DETAIL

The Southwestern Area -

The largest processing snap bean enterprises are operated by growers headquartered in Erie, Cattaraugus and Chautauqua Counties in Southwestern New York. These growers experienced the highest growing costs per acre of the four Areas. They obtained the highest yields and had the shortest, coolest growing season with the most rainfall when compared with the other Areas. The season was also shorter, cooler and much wetter than normal for that Area (Table 6). Growers in this Area harvested only 84 percent of their planted acres due to excessive rainfall during the harvest season.

Land costs were generally \$10 to \$20 per acre higher than in the other Areas. A high percent (81%) of the land was rented and the large size of the enterprises dictated that higher costs were experienced as distance from the base of operations increased. Cover crops were used more extensively than in the other three Areas resulting in cover crop costs per acre being double what they were elsewhere. Fertilizer costs tended to be higher than the other three Areas with about 50 percent more nitrogen being applied to the crop. Finally, planting rates and the cost of chemicals were highest in the Southwestern Area of the State.

Table 16 shows the detail of the growing costs for the Southwestern Area. These costs totalled \$237 per acre (\$25 higher than the State average) and \$96 per ton.

Table 16.

PROCESSING SNAP BEANS
Growing Costs
Southwestern Area, New York
8,163 Acres Planted on 7 Farms, 1977
(6,863 Acres Harvested)

Item	Rates per acre	Cost	
		Per acre planted	Per ton*
Number of farms		7	
Acres per enterprise		1,166	
Yield per acre planted, tons*		2.5	
Labor	3.3 hr	\$ 15	\$ 6
Tractor	2.1 hr	11	4
Equipment, large trucks		9	4
Custom work, equipment rent		2	1
Land use		55	22
Lime, cover crop, manure		16	6
Fertilizer: Lbs. N-45, P-91, K-39		30	12
Seed: 103 lbs.		69	28
Chemicals		23	10
Interest on operating capital		3	1
All other		4	2
Total growing costs		\$237	\$96

*Paid weight.

Harvesting costs per acre harvested for the Southwestern Area are presented in Table 17. This amounted to \$62 per acre harvested and was the highest of any Area due to the wetter harvest conditions, higher yield and greater distances involved with the larger enterprises. The high yield caused the harvest cost of \$21 per ton to be the lowest of any Area.

Table 17.

PROCESSING SNAP BEANS
Harvesting Costs
Southwestern Area, New York
8,163 Acres Planted on 7 Farms, 1977
(6,863 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	7	
Acres per enterprise	1,166	
Yield per acre harvested, tons*	2.9	
Labor 3.2 hr/ac	\$16	\$ 6
Tractor	1	--
Equipment	42	14
Custom work, equipment rent	--	--
All other	<u>3</u>	<u>1</u>
Total harvesting costs	\$62	\$21

*Paid weight

Selling costs, which include mainly hauling costs, averaged \$22 per acre harvested and \$8 per ton (Table 18). Interest on accounts receivable amounted to \$6 per acre or \$2 per ton.

Table 18.

PROCESSING SNAP BEANS
Selling Costs
Southwestern Area, New York
8,163 Acres Planted on 7 Farms, 1977
(6,863 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	7	
Acres per enterprise	1,166	
Yield per acre harvested, tons*	2.9	
Labor	\$ 3	\$1
Truck	9	3
Custom haul	3	2
Interest on accounts receivable	6	2
All other	<u>1</u>	<u>-</u>
Total selling costs	\$22	\$8

*Paid weight

In the following tables, Tables 19 and 20, the enterprise costs and returns are summarized and selected factors for individual enterprises are listed. Returns in the Southwestern Area averaged \$136 per ton - the lowest of the four Areas studied. Profits averaged \$28 per acre or \$11 per ton and the growers received \$1.09 for each dollar of cost invested in snap beans. In this context, profits are the returns in excess of all costs including the cost of the operator's management as well as his labor.

Table 19.

PROCESSING SNAP BEANS
Enterprise Costs and Returns
Southwestern Area, New York
8,163 Acres Planted on 7 Farms, 1977
(6,863 Acres Harvested)

Item	Cost	
	Per acre planted	Per ton*
Number of farms	7	
Acres per enterprise	1,166	
Yield per acre planted, tons*	2.5	
Costs to:		
Grow	\$237	\$ 96
Harvest	52	21
Produce	\$289	\$117
Sell	19	8
Total costs	\$308	\$125
Returns	\$336	\$136
Profit	\$ 28	\$ 11
Return per dollar of cost	\$1.09	

*Paid weight

Table 20.

PROCESSING SNAP BEANS
Selected Factors
Southwestern Area, New York
8,163 Acres Planted on 7 Farms, 1977
(6,863 Acres Harvested)

Farm No.	Yield per acre	Average per acre planted			Avg per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Cost	Return	
	Tn	\$	\$	\$	\$	\$	\$
107	2.8	264	56	63	117	140	1.19
102	2.5	234	70	25	126	136	1.08
110	2.3	228	54	-9	130	126	0.97
103	2.5	226	71	60	119	144	1.20
108	1.4	178	62	-59	172	128	0.75
111	2.3	233	64	-6	128	125	0.98
109	1.9	222	70	-24	154	142	0.92
Range	1.4 to 2.8	178 to 264	54 to 71	-59 to 63	117 to 172	125 to 144	0.75 to 1.20
Weighted average	2.5	237	62*	28	125	136	1.09

* Per acre harvested

** Paid weight

The Western Area -

In Western New York, Monroe, Genesee and Orleans Counties also experienced difficult harvest conditions due to excessive rainfall. In that area the growing season was a little longer and warmer than normal. The major climatic problem was the timing and intensity of rainfall. The abnormal lack of moisture during the planting season was far more than offset by the doubling or tripling of normal rainfall during the harvest season (Table 7).

Growing costs per acre in this Area were the lowest of the four Areas studied. Compared to the State average of \$212 per acre, the Western Area had growing costs of \$180 per acre and \$95 per ton. The lower costs per acre were not restricted to certain inputs but rather were shown in every major input item.

Table 21.

PROCESSING SNAP BEANS
Growing Costs
Western Area, New York
4,349 Acres Planted on 11 Farms, 1977
(3,927 Acres Harvested)

Item	Rates per acre	Cost	
		Per acre planted	Per ton*
Number of farms		11	
Acres per enterprise		395	
Yield per acre planted, tons*		1.9	
Labor	2.5 hr	\$ 13	\$ 7
Tractor	1.8 hr	10	5
Equipment, large trucks		10	5
Custom work, equipment rent		1	1
Land use		33	17
Lime, cover crop, manure		6	3
Fertilizer: Lbs. N-31, P-69, K-36		22	12
Seed: 91 lbs.		61	32
Chemicals		17	9
Interest on operating capital		2	1
All other		<u>5</u>	<u>3</u>
Total growing costs		\$180	\$95

*Paid weight

Harvesting costs per acre harvested were lower for this Area than for the other three Areas. These costs amounted to \$55 per acre harvested and \$26 per ton (Table 22).

Table 22.

PROCESSING SNAP BEANS
Harvesting Costs
Western Area, New York
4,349 Acres Planted on 11 Farms, 1977
(3,927 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	11	
Acres per enterprise	395	
Yield per acre harvested, tons*	2.1	
Labor 2.0 hr/ac	\$11	\$ 5
Tractor	--	--
Equipment	40	19
Custom work, equipment rent	---	---
All other	<u>4</u>	<u>2</u>
Total harvesting costs	\$55	\$26

*Paid weight

All eleven growers in the Western Area hauled their own snap beans to the processor as shown by the absence of a cost for custom hauling in Table 23. These hauling costs plus a charge for interest on accounts receivable resulted in selling costs totalling \$13 per acre harvested and \$6 per ton for these growers.

Table 23.

PROCESSING SNAP BEANS
Selling Costs
Western Area, New York
4,349 Acres Planted on 11 Farms, 1977
(3,927 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	11	
Acres per enterprise	395	
Yield per acre harvested, tons*	2.1	
Labor	\$ 3	\$1
Truck	5	3
Custom haul	--	--
Interest on accounts receivable	4	2
All other	1	--
Total selling costs	\$13	\$6

*Paid weight

In summary, the growers in the Western Area had total costs of \$241 per acre or \$127 per ton of snap beans. With an average return of \$146 per ton, these enterprises showed a profit of \$35 per acre and \$19 per ton and a return per dollar of cost of \$1.15. Returns per ton were above average and with below average costs per acre profits were above the State average in spite of relatively low yields. These growers harvested about 90 percent of their planted acreage.

Tables 24 and 25 summarize costs and returns for these growers and illustrate the range of selected factors for individual growers.

Table 24.

PROCESSING SNAP BEANS
Enterprise Costs and Returns
Western Area, New York
4,349 Acres Planted on 11 Farms, 1977
(3,927 Acres Harvested)

Item	Cost or Return	
	Per acre planted	Per ton*
Number of farms	11	
Acres per enterprise	395	
Yield per acre planted, tons*	1.9	
Costs to:		
Grow	\$180	\$ 95
Harvest	49	26
Produce	\$229	\$121
Sell	12	6
Total costs	\$241	\$127
Returns	\$276	\$146
Profit	\$35	\$19
Return per dollar of cost	\$1.15	

*Paid weight

Table 25.

PROCESSING SNAP BEANS
Selected Factors
Western Area, New York
4,349 Acres Planted on 11 Farms, 1977
(3,927 Acres Harvested)

Farm No.	Yield per acre	Average per acre planted			Avg per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Cost	Return	
	Tn	\$	\$	\$	\$	\$	\$
230	2.0	183	43	61	118	150	1.26
231	2.0	179	53	42	119	140	1.18
235	2.3	188	67	59	117	144	1.22
236	1.3	169	54	-38	174	145	0.84
239	1.8	179	64	22	137	149	1.09
238	1.8	145	48	36	115	136	1.18
232	1.5	181	81	-42	171	144	0.84
224	2.1	183	96	16	134	141	1.06
237	2.2	230	46	67	130	160	1.23
225	1.6	150	86	-18	144	133	0.92
229	1.0	202	88	-148	290	145	0.50
Range	1.0 to 2.3	145 to 230	43 to 96	-148 to 67	115 to 290	133 to 160	0.50 to 1.26
Weighted average	1.9	180	55*	35	127	146	1.15

* Per acre harvested

** Paid weight

The Central Area -

The average size of the snap bean enterprise in the Central New York Area was 293 acres - the smallest of the four Areas studied. Yield also was one of the lowest of the four Areas and averaged only 1.9 tons per acre planted. As in the Western Area, these growers harvested about 90 percent of their planted acreage. Rainfall was excessive during the harvest season but not to the extent experienced in the Western Area. The season was slightly cooler and longer than normal for that part of the State.

Growing costs averaged \$206 per acre and, with the low yield, growing costs were the highest of the four areas at \$111 per ton. Cash costs for fertilizer, seed and chemicals accounted for over half of the total growing cost as was the case for each Area.

Table 26.

PROCESSING SNAP BEANS
Growing Costs
Central Area, New York
4,986 Acres Planted on 17 Farms, 1977
(4,495 Acres Harvested)

Item	Rates per acre	Cost	
		Per acre planted	Per ton*
Number of farms		17	
Acres per enterprise		293	
Yield per acre planted, tons*		1.9	
Labor	3.6 hr	\$ 17	\$ 9
Tractor	2.6 hr	15	8
Equipment, large trucks		9	5
Custom work, equipment rent		2	1
Land use		44	24
Lime, cover crop, manure		7	4
Fertilizer: Lbs. N-31, P-80, K-46		23	12
Seed; 87 lbs.		66	36
Chemicals		17	9
Interest on operating capital		2	1
All other		4	2
Total growing costs		\$206	\$111

*Paid weight

With a large number of relatively small growers in the Central New York Area, custom harvesting was more prevalent than in other Areas. In fact, all of the growers in the Southwestern and Western Areas owned their own harvesters and only a small acreage in the Utica Area was harvested by custom operators. A comparison of custom harvesting costs and owned harvester costs for the Central Area is presented in a later section in this report.

On the average, growers in the Central Area had harvesting costs of \$59 per acre harvested and \$28 per ton of snap beans (Table 27).

Table 27.

PROCESSING SNAP BEANS

Harvesting Costs*

Central Area, New York

4,986 Acres Planted on 17 Farms, 1977

(4,495 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	17	
Acres per enterprise	293	
Yield per acre harvested, tons*	2.1	
Labor 2.3 hr/ac	\$11	\$ 5
Tractor	1	--
Equipment	38	18
Custom work, equipment rent	6	3
All other	<u>3</u>	<u>2</u>
Total harvesting costs	\$59	\$28

*Paid weight

Although some custom hauling of snap beans was done in the Central Area, most of the crop was hauled on grower owned trucks. Hauling costs plus interest on receivables amounted to \$16 per acre harvested and \$8 per ton for these growers (Table 28).

Table 28.

PROCESSING SNAP BEANS
Selling Costs
Central Area, New York
4,986 Acres Planted on 17 Farms, 1977
(4,495 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	17	
Acres per enterprise	293	
Yield per acre harvested, tons*	2.1	
Labor	\$ 2	\$1
Truck	8	4
Custom Haul	2	1
Interest on accounts receivable	4	2
All other	--	--
Total selling costs	\$16	\$8

*Paid weight

As shown in Table 29, growers in the Central Area did a little better than break even on their snap bean enterprises in 1977. Total costs were slightly less than total returns and the growers received \$1.02 for each dollar of cost for the enterprise.

Table 30 shows the variation in certain factors between the individual growers in this group.

Table 29.

PROCESSING SNAP BEANS
Enterprise Costs and Returns
Central Area, New York
4,986 Acres Planted on 17 Farms, 1977
(4,495 Acres Harvested)

Item	Cost or Return	
	Per acre planted	Per ton*
Number of farms	17	
Acres per enterprise	293	
Yield per acre planted, tons*	1.9	
Costs to:		
Grow	\$206	\$111
Harvest	53	28
Produce	\$259	\$139
Sell	15	8
Total costs	\$274	\$147
Returns	\$280	\$151
Profit	\$6	\$4
Return per dollar of cost	\$1.02	

*Paid weight

Table 30.

PROCESSING SNAP BEANS
Selected Factors
Central Area, New York
4,986 Acres Planted on 17 Farms, 1977
(4,495 Acres Harvested)

Farm No.	Yield per acre	Average per acre planted			Avg per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Cost	Return	
	Tn	\$	\$	\$	\$	\$	\$
316	2.0	214	50	14	141	148	1.05
322	1.8	206	66	1	152	153	1.01
323	1.4	227	40	-38	194	167	0.86
327	1.9	194	55	45	130	153	1.18
317	1.5	230	62	-66	191	148	0.78
328	1.9	182	75	39	136	156	1.15
326	1.6	183	52	-3	150	148	0.99
333	2.2	200	64	98	120	164	1.36
305	2.6	199	85	69	117	144	1.23
315	1.4	218	82	-88	211	148	0.70
301	1.7	205	75	-56	159	127	0.80
306	2.1	161	66	48	119	142	1.19
334	1.4	219	116	-88	218	155	0.71
319	1.5	160	68	-34	153	130	0.85
313	2.1	217	61	-25	141	129	0.92
318	3.0	187	95	147	103	153	1.48
320	0.9	177	60	-93	242	143	0.59
Range	0.9 to 3.0	160 to 230	40 to 116	-93 to 147	103 to 242	127 to 167	0.59 to 1.48
Weighted average	1.9	206	59*	6	147	151	1.02

* Per acre harvested

** Paid weight

The Utica Area -

This area of the State has the fewest number of processing snap bean growers of the four Areas studied. The four growers interviewed account for slightly less than half of the number of growers but probably more than half the acreage. Thus, the average size of these four enterprises - 574 acres - is likely somewhat larger than the average grower in the Area.

The growing season for the Utica Area in 1977 was closer to normal than was the case for the other Areas. Although the season was dry in May and wet in September, rainfall was quite normal during the summer. Temperatures averaged a little warmer and the season was a little longer than normal.

About two-thirds of the bean acreage was rented - usually from dairymen who had excess cropland. Yields in this Area averaged 2.2 tons per acre and were higher than growers experienced in the Central and Western New York Areas. Growing costs averaged \$195 per acre and \$91 per ton for these four growers (Table 31).

Table 31. PROCESSING SNAP BEANS
Growing Costs
Utica Area, New York
2,295 Acres Planted on 4 Farms, 1977
(2,200 Acres Harvested)

Item	Rates per acre	Cost	
		Per acre planted	Per ton*
Number of farms		4	
Acres per enterprise		574	
Yield per acre planted, tons*		2.2	
Labor	3.5 hr	\$ 15	\$ 7
Tractor	2.5 hr	12	6
Equipment, large trucks		11	5
Custom work, equipment rent		--	--
Land use		44	20
Lime, cover crop, manure		7	3
Fertilizer: Lbs. N-31, P-93, K-31		25	12
Seed: 85 lbs.		63	29
Chemicals		12	6
Interest on operating capital		2	1
All other		4	2
Total growing costs		\$195	\$91

*Paid weight

Harvesting costs in the Utica Area included some custom work but generally growers harvested their snap beans with their own harvesters. Costs averaged \$59 per acre harvested and \$26 per ton (Table 32). These growers harvested nearly 96 percent of their planted acreage - the highest of the four Areas.

Table 32.

PROCESSING SNAP BEANS
Harvesting Costs
Utica Area, New York
2,295 Acres Planted on 4 Farms, 1977
(2,200 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	4	
Acres per enterprise	574	
Yield per acre harvested, tons*	2.3	
Labor 2.3 hr/ac	\$10	\$ 4
Tractor	---	---
Equipment	44	19
Custom work, equipment rent	2	1
All other	3	2
Total harvesting costs	\$59	\$26

*Paid weight

Growers in the Utica Area hired most of their crop hauled on a custom basis. That plus the fact that distances to the processors tended to be greater than in the other Areas resulted in the highest selling costs for the four Areas. Total selling costs averaged \$27 per acre harvested and \$12 per ton of snap beans (Table 33).

Table 33.

PROCESSING SNAP BEANS
Selling Costs
Utica Area, New York
2,295 Acres Planted on 4 Farms, 1977
(2,200 Acres Harvested)

Item	Cost	
	Per acre harvested	Per ton*
Number of farms	4	
Acres per enterprise	574	
Yield per acre harvested, tons*	2.3	
Labor	\$ 1	\$ 1
Truck	3	1
Custom haul	21	9
Interest on accounts receivable	2	1
All other	--	--
Total selling costs	\$27	\$12

*Paid weight

Returns for snap beans in the Utica Area averaged \$146 per ton. With a yield of 2.2 tons per acre and a total cost of \$278 per acre and \$129 per ton, profits averaged \$37 per acre and \$17 per ton. Snap beans returned \$1.13 per dollar of cost on the average for these four growers (Table 34).

Table 35 shows the variation in selected factors for the growers in this Area.

Table 34.

PROCESSING SNAP BEANS
Enterprise Costs and Returns
Utica Area, New York
2,295 Acres Planted on 4 Farms, 1977
(2,200 Acres Harvested)

Item	Cost or Return	
	Per acre planted	Per ton*
Number of farms	4	
Acres per enterprise	574	
Yield per acre planted, tons*	2.2	
Costs to:		
Grow	\$195	\$ 91
Harvest	57	26
Produce	\$252	\$117
Sell	26	12
Total costs	\$278	\$129
Returns	\$315	\$146
Profit	\$37	\$17
Return per dollar of cost	\$1.13	

*Paid weight

Table 35.

PROCESSING SNAP BEANS
Selected Factors
Utica Area, New York
2,295 Acres Planted on 4 Farms, 1977
(2,200 Acres Harvested)

Farm No.	Yield per acre	Average per acre planted			Avg per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Cost	Return	
	Tn	\$	\$	\$	\$	\$	\$
414	1.5	203	62	-50	185	151	0.82
412	2.6	194	67	107	116	157	1.35
421	2.4	185	52	49	105	125	1.20
404	2.7	199	47	131	103	152	1.47
Range	1.5 to 2.7	185 to 203	46 to 67	-50 to 131	103 to 185	125 to 157	0.82 to 1.47
Weighted average	2.2	195	58*	37	129	146	1.13

* Per acre harvested

** Paid weight

RESULTS BASED ON SIZE OF ENTERPRISE

Western and Central Areas Compared -

In each of the four Areas defined in this study, the size of the snap bean enterprise varied considerably. However, in the Western and Central Areas there were enough enterprises within a reasonable size range, that average figures for those two groups are compared in Table 36. Nine enterprises in the Western Area averaged 207 acres each and ranged from 60 to 387 acres per enterprise. In the Central Area there were 16 enterprises ranging from 45 to 488 acres with an average of 218 acres per enterprise. Both groups had yields averaging 1.8 tons per acre planted.

Growing costs were considerably higher for the group in the Central Area. This was due primarily to higher land costs which averaged \$49 per acre in the Central Area compared to \$30 per acre in the Western Area. Growers in the Central Area used somewhat more labor and tractor time as well as cover crops in the growing of the snap bean crop.

Western Area growers had slightly higher harvesting and hauling costs than growers in the Central Area. Returns averaged \$8 per ton higher for growers in the Central Area group. The lower total cost per acre for growers in the Western Area more than offset the higher returns per ton received by the Central Area growers resulting in somewhat higher profits for the Western Area growers.

Table 36.

PROCESSING SNAP BEANS
Enterprise Costs and Returns
by Size of Enterprise
Western and Central Areas Compared
New York, 1977

Item	Western Area		Central Area	
	9 entr - under 400 acres		16 entr - under 500 acres	
	Per acre planted	Per ton*	Per acre planted	Per ton*
Number of farms	9		16	
Acres per enterprise	207		218	
Yield per acre planted, tons*	1.8		1.8	
	\$	\$	\$	\$
		per acre planted		
Costs: Growing	177	99	203	114
Harvesting	60	33	55	31
Production	237	132	258	145
Selling	12	7	11	6
Total costs	249	139	269	151
Returns	258	144	272	152
Profit	9	5	3	1
Return per dollar of cost	\$1.04		\$1.01	

*Paid weight

New York State -

Tables 37 and 38 show general cost and return data for snap bean enterprises when grouped according to size of the enterprise as measured by acres of the crop.

In a group of crop enterprises as widely varied in circumstances as these 39 enterprises, the effects of size are not as apparent as they would be if conditions other than size were more uniform. Although growing costs seem to increase with enterprise size as shown in Table 37 there are more specific reasons for the higher growing costs. The larger snap bean enterprises tended to use more cover crop, fertilizer, seed and chemicals. The largest size group was strongly influenced by enterprises in the Southwestern Area where land costs were highest. Also, the larger the enterprise the greater the cost of travel between fields to carry out various growing operations.

Harvesting costs per acre did seem to be directly related to size of enterprise. The smallest size group contained all but one of the enterprises that used a custom operator to harvest the crop. The larger enterprises were able to make more efficient use of harvesting equipment investments. Even though Table 37 shows harvesting costs on a per acre planted basis the trend of decreasing costs as size increases is also the case on a per acre harvested basis. Each group left a similar percent of the crop unharvested.

Table 38 shows the costs and returns for the different size groups on a per ton basis. The returns per ton were quite similar between size groups except for the group having from 300 to 400 acres of snap beans per enterprise. In that case, returns averaged \$151 per ton - \$9 higher than the State average. Harvesting costs per ton, decreased as size of enterprise increased. Since selling costs involved mainly the cost to haul the crop, they varied with yield and hauling distance.

In general, profits tended to increase as size of enterprise increased.

Table 37.

PROCESSING SNAP BEANS
Enterprise Costs and Returns per Acre
by Size of Enterprise
39 Farms, New York, 1977

Item	100 ac. or less	100 to 300 ac.	300 to 400 ac.	400 to 800 ac.	Over 800 ac.	All farms
Number of farms	9	8	7	7	8	39
Acres per enterprise	70	193	332	490	1484	508
Yield per acre planted, tons*	1.8	2.0	1.8	2.0	2.3	2.2
	\$	\$	\$	\$	\$	\$
	per acre planted					
Cost:						
Growing	189	193	190	201	223	212
Harvesting	<u>66</u>	<u>61</u>	<u>56</u>	<u>53</u>	<u>50</u>	<u>52</u>
Production	255	254	246	254	273	264
Selling	<u>13</u>	<u>17</u>	<u>11</u>	<u>15</u>	<u>18</u>	<u>17</u>
Total costs	268	271	257	269	291	281
Returns	257	288	273	288	323	306
Profit	-11	17	16	19	32	25
Return per dollar of cost	0.96	1.06	1.06	1.07	1.11	1.09

*Paid weight

Table 38.

PROCESSING SNAP BEANS
Enterprise Costs and Returns per Ton
by Size of Enterprise
39 Farms, New York, 1977

Item	100 ac. or less	100 to 300 ac.	300 to 400 ac.	400 to 800 ac.	Over 800 ac.	All farms
Number of farms	9	8	7	7	8	39
Acres per enterprise	70	193	332	490	1484	508
Yield per acre planted, tons*	1.8	2.0	1.8	2.0	2.3	2.2
	\$	\$	\$	\$	\$	\$
	per ton					
Costs:						
Growing	107	96	105	100	97	99
Harvesting	<u>37</u>	<u>30</u>	<u>31</u>	<u>27</u>	<u>22</u>	<u>24</u>
Production	144	126	136	127	119	123
Selling	<u>7</u>	<u>9</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>8</u>
Total costs	151	135	142	134	127	131
Returns	145	143	151	144	141	142
Profit	-6	8	9	10	14	11
Return per dollar of cost	0.96	1.06	1.06	1.07	1.11	1.09

*Paid weight

RESULTS BASED ON YIELD

Yield is the most important single factor affecting enterprise profits. This is illustrated in an examination of the results of this snap bean study when the records are grouped according to yield. Four groups were established as follows: enterprises with yields below 1.5 tons per acre, from 1.5 to 1.9 tons per acre, from 2.0 to 2.4 tons per acre and those with yields of 2.5 tons or more per acre.

The results of this grouping indicate a direct relationship between yield and profit per acre. The group having the highest yield also had the highest profit per acre. The group with the highest average profit per acre did not have the lowest costs per acre, nor did they have the highest return per ton for the crop. In fact, growing costs per acre were highest for the group with the highest profit - \$40 per acre higher than the lowest yield group. Harvesting costs per acre did not seem to be related to yield. However, selling costs per acre (mostly for hauling the crop to the processor) did increase with yield because of the larger quantity to haul from each acre.

Tables 39 and 40 indicate how profits increased as yield increased. Also, at the bottom of Table 39, the percent of planted acres that were harvested is shown along with the harvesting costs per acre actually harvested.

Table 39.

PROCESSING SNAP BEANS
Enterprise Costs and Returns per Acre
According to Yield
39 Farms, New York, 1977

Item	Yield per acre*				All farms
	Under 1.5 tons	1.5 to 1.9 tons	2.0 to 2.4 tons	2.5 tons and over	
Number of farms	7	13	12	7	39
Acres per enterprise	231	308	637	933	508
Yield per acre planted, tons*	1.3	1.7	2.1	2.7	2.2
	\$	\$	\$	\$	\$
	per acre planted				
Costs:					
Growing	197	194	202	237	212
Harvesting	<u>50</u>	<u>56</u>	<u>49</u>	<u>55</u>	<u>52</u>
Production	247	250	251	292	264
Selling	<u>8</u>	<u>11</u>	<u>15</u>	<u>25</u>	<u>17</u>
Total costs	255	261	266	317	281
Returns	198	251	297	378	306
Profit	-57	-10	31	61	25
Return per dollar of cost	0.78	0.96	1.11	1.19	1.09
Percent of planted acres harvested	86.4%	87.6%	91.8%	85.2%	88.3%
Harvesting costs per acre harvested	\$58	\$64	\$53	\$64	\$59

*Paid weight

Table 40.

PROCESSING SNAP BEANS
Enterprise Costs and Returns per Ton
According to Yield
39 Farms, New York, 1977

Item	Yield per acre*				All farms
	Under 1.5 tons	1.5 to 1.9 tons	2.0 to 2.4 tons	2.5 tons and over	
Number of farms	7	13	12	7	39
Acres per enterprise	231	308	637	933	508
Yield per acre planted, tons*	1.3	1.7	2.1	2.7	2.2
	\$	\$	\$	\$	\$
	per ton*				
Costs:					
Growing	146	115	95	89	99
Harvesting	<u>37</u>	<u>33</u>	<u>23</u>	<u>21</u>	<u>24</u>
Production	183	148	118	110	123
Selling	<u>7</u>	<u>6</u>	<u>7</u>	<u>9</u>	<u>8</u>
Total costs	190	154	125	119	131
Returns	148	148	140	142	142
Profit	-42	-6	15	23	11
Return per dollar of cost	0.78	0.96	1.11	1.19	1.09

*Paid weight

The following four tables show various factors for individual enterprises in each of the groups of enterprises based on yield. None of the enterprises having yields less than 1.8 tons per acre made a profit. On the other hand, all of the enterprises having yields of 2.4 tons or more per acre showed profits on the enterprise. Only four of the 25 enterprises that had yields of 1.8 tons or more per acre experienced losses. In each of these cases, the enterprise showed higher than average costs per acre and/or a significantly lower than average return per ton.

Table 41.

PROCESSING SNAP BEANS
Selected Factors for Enterprises
With Yields of less than 1.5 Tons per Acre
1,614 acres on 7 Farms, New York, 1977

Farm No.	Yield per acre	Average per acre planted			Average per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Costs	Returns	
	Tn	\$	\$	\$	\$	\$	\$
108	1.4	178	62	-59	172	128	0.75
323	1.4	227	40	-38	194	167	0.86
236	1.3	169	54	-38	174	145	0.84
315	1.4	218	82	-88	211	148	0.70
334	1.4	219	116	-88	218	155	0.71
229	1.0	202	88	-148	290	145	0.50
320	0.9	177	60	-93	242	143	0.59
Range	0.9 to 1.4	169 to 227	40 to 116	-148 to -38	172 to 290	128 to 167	0.50 to 0.86
Weighted average	1.3	197	58	-57	190	148	0.78

* Per harvested acre

** Paid weight

Table 42.

PROCESSING SNAP BEANS
Selected Factors for Enterprises
With Yields of 1.5 to 1.9 Tons per Acre
4,002 acres on 13 Farms, New York, 1977

Farm No.	Yield per acre	Average per acre planted			Average per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Costs	Returns	
	Tn	\$	\$	\$	\$	\$	\$
414	1.5	203	62	-50	185	151	0.82
322	1.8	206	66	1	152	153	1.01
327	1.9	194	55	45	130	153	1.18
317	1.5	230	62	-66	191	148	0.78
239	1.8	179	64	22	137	149	1.09
328	1.9	182	75	39	136	156	1.15
326	1.6	183	52	-3	150	148	0.99
109	1.9	222	70	-24	154	142	0.92
238	1.8	145	48	36	115	136	1.18
232	1.5	181	81	-42	171	144	0.84
301	1.7	205	75	-56	159	127	0.80
225	1.6	150	86	-18	144	133	0.92
319	1.5	160	68	-34	153	130	0.85
Range	1.5 to 1.9	145 to 230	48 to 86	-66 to 45	115 to 191	127 to 156	0.78 to 1.18
Weighted average	1.7	194	64	-10	154	148	0.96

* Per harvested acre

** Paid weight

Table 43.

PROCESSING SNAP BEANS
Selected Factors for Enterprises
With Yields of 2.0 to 2.4 Tons per Acre
7,647 acres on 12 Farms, New York, 1977

Farm No.	Yield per acre	Average per acre planted			Average per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Costs	Returns	
	Tn	\$	\$	\$	\$	\$	\$
230	2.0	183	43	61	118	150	1.26
110	2.3	228	54	-9	130	126	0.97
316	2.0	214	50	14	141	148	1.05
231	2.0	179	53	42	119	140	1.18
421	2.4	185	52	49	105	125	1.20
111	2.3	233	64	-6	128	125	0.98
235	2.3	188	67	59	117	144	1.22
333	2.2	200	64	98	120	164	1.36
224	2.1	183	96	16	134	141	1.06
237	2.2	230	46	67	130	160	1.23
306	2.1	161	66	48	119	142	1.19
313	2.1	217	61	-25	141	129	0.92
Range	2.0 to 2.4	161 to 233	43 to 96	-25 to 98	105 to 141	125 to 164	0.92 to 1.36
Weighted average	2.1	202	53	31	125	140	1.11

* Per harvested acre

** Paid weight

Table 44.

PROCESSING SNAP BEANS
Selected Factors for Enterprises
With Yields of 2.5 Tons and Over per Acre
6,530 acres on 7 Farms, New York, 1977

Farm No.	Yield per acre	Average per acre planted			Average per ton**		Return per \$ of cost
		Grow cost	Harvest cost*	Profit	Costs	Returns	
	Tn	\$	\$	\$	\$	\$	\$
107	2.8	264	56	63	117	140	1.19
102	2.5	234	70	25	126	136	1.08
103	2.5	226	71	60	119	144	1.20
412	2.6	194	67	107	116	157	1.35
404	2.7	199	47	131	103	152	1.47
305	2.6	199	85	69	117	144	1.23
318	3.0	187	95	147	103	153	1.48
Range	2.5 to 3.0	187 to 264	47 to 95	25 to 147	103 to 126	136 to 157	1.08 to 1.48
Weighted average	2.7	237	64	61	119	142	1.19

* Per harvested acre

** Paid weight

Determining the Break Even Yield -

The yield necessary to break even can be determined simply by dividing the total cost per acre by the returns per ton. The following table will provide some guides to break even yields necessary for various cost and return levels.

Table 45.

PROCESSING SNAP BEANS
BREAK EVEN YIELDS
at Various Cost and Return Levels

Total cost per acre	Yield necessary to break even with returns per ton averaging:				
	\$125	\$135	\$145	\$155	\$165
	Tons per acre				
\$225	1.8	1.7	1.6	1.5	1.4
250	2.0	1.9	1.7	1.6	1.5
275	2.2	2.0	1.9	1.8	1.7
300	2.4	2.2	2.1	1.9	1.8
325	2.6	2.4	2.2	2.1	2.0
350	2.8	2.6	2.4	2.3	2.1

CUSTOM HARVEST COSTS AND OWN HARVEST COSTS COMPARED

The hiring of custom operators to harvest the snap bean crop was used to a significant extent only in the Central Area. No custom harvesting was reported in either the Southwestern or the Western Areas. Only a small amount of custom harvesting was encountered in the Utica Area.

In the Central Area one grower had snap bean acreage enough greater than the rest in that group that he was excluded from this comparison. Of the remaining 16 growers, six used custom operators to harvest their snap beans and 10 owned their own harvesters. Commonly, the custom harvesters were operated by the processor to whom the grower sold his crop.

The six growers who hired their snap beans harvested averaged 70 acres per enterprise with a range of 45 to 117 acres per enterprise. Those who owned their own harvesters averaged 307 acres with a range of 79 to 488 acres per enterprise. Yields were similar for the two groups.

Table 46 shows the actual cost of the custom work averaged \$66 per acre harvested. The "all other" costs include an allowance for a variety of general expense items of an overhead nature. Although harvesting costs per acre and per ton were higher for the custom operations than for owned harvesters, growers with small acreages were minimizing their harvest costs by hiring it done.

Table 46.

PROCESSING SNAP BEANS Harvesting Costs Custom vs. Owned Harvesters 16 Farms, Central Area, New York, 1977

Item	Custom harvesters	Owned harvesters
Number of farms	6	10
Acres per enterprise	70	307
Yield per acre harvested, tons	1.9	1.8
per acre harvested		
Harvesting costs:		
Labor	\$ 1	\$10
Tractor	--	1
Equipment	--	--
Custom work, equipment rent	66	48
All other	<u>4</u>	<u>3</u>
Total cost	\$71	\$62
Harvest cost per ton	\$33	\$31
Percent of planted acres harvested	85.7%	38.4%

COMPARISON OF PROFITABLE AND UNPROFITABLE ENTERPRISES

A comparison of the results shown for profitable and unprofitable snap bean enterprises will emphasize some of the reasons for profit or the lack of it. Table 47 shows the most important factors for these two groups of growers along with a break down according to the size of enterprise.

Profitable enterprises tended to have larger acreages of snap beans. In addition to being larger, they also had significantly higher yields per acre. Returns per ton averaged \$7 higher than for the unprofitable enterprises. Although total costs per acre were somewhat higher for the profitable enterprises, higher yields per acre and returns per ton resulted in significantly higher profits per acre. The profitable group had profits averaging \$50 per acre compared to an average loss of \$34 per acre for the unprofitable group.

As noted earlier, a high yield is essential to a good profit. Keeping costs under control is always good business, but the ability to obtain consistently high yields will offset high costs and low prices to a great extent.

Table 47.

PROCESSING SNAP BEANS
Profitable and Unprofitable Enterprises Compared
19,793 Acres on 39 Farms, New York, 1977

Item	Unprofitable Enterprises			Profitable Enterprises		
	Under 200 ac.	Over 200 ac.	All farms	Under 400 ac.	Over 400 ac.	All farms
Number of farms	9	9	18	11	10	21
Acres per enterprise	94	559	327	220	1150	663
Yield per acre planted, tons	1.5	1.8	1.7	2.2	2.4	2.3
Costs per acre planted:	\$	\$	\$	\$	\$	\$
Growing	193	212	210	186	218	213
Harvesting	<u>66</u>	<u>51</u>	<u>53</u>	<u>60</u>	<u>51</u>	<u>52</u>
Production	259	263	263	246	269	265
Selling	<u>11</u>	<u>12</u>	<u>11</u>	<u>16</u>	<u>19</u>	<u>19</u>
Total costs per acre	270	275	274	262	288	284
Returns per acre	207	246	240	324	336	334
Profits per acre	-63	-29	-34	62	48	50
Costs per ton:	\$	\$	\$	\$	\$	\$
Growing	130	118	120	85	93	92
Harvesting	<u>44</u>	<u>28</u>	<u>30</u>	<u>28</u>	<u>22</u>	<u>22</u>
Production	174	146	150	113	115	114
Selling	<u>7</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>8</u>	<u>8</u>
Total costs per ton	181	153	157	121	123	122
Returns per ton	139	137	137	150	143	144
Profits per ton	-42	-16	-20	29	20	22
Return per dollar of cost	\$0.77	\$0.89	\$0.88	\$1.24	\$1.17	\$1.18
Costs per acre for:	\$	\$	\$	\$	\$	\$
Land	45	43	43	40	49	47
Fertilizer	20	30	29	25	25	25
Seed	64	67	67	60	67	66
Chemicals	16	18	18	13	21	19
Seed per acre, lbs.	86	95	94	84	96	94